Louisiana Department of Environmental Quality
Office of Environmental Services

STATEMENT OF BASIS
For
Activity Number: PER20020002
Permit No. 2489-V1

Geismar Plant – PDO-1 Unit
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana

I. APPLICANT

Company
Shell Chemical LP
Post Office Box 500
Geismar, Louisiana 70734

Facility
Geismar Plant – PDO-1 Unit
7594 Highway 75, Geismar, Ascension Parish, Louisiana
UTM Coordinates: 693.20 kilometers East and 3340.74 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

Ethylene oxide reacts with carbon monoxide and hydrogen to form 3-hydroxypropionaldehyde which is the hydrogenated to produce 1,3-propanediol (PDO). Various co-products are also produced and recovered during the purification process. Wastewater is sent to the biotreater for organic removal.

The PDO-1 Unit is a part of the Shell's Geismar Plant. Active permits and pending applications for the operations at the facilities are listed as follows:

Permit Number	Units or Sources	Date Issued
2489-V0	PDO-1 Unit	November 3, 1997
PSD-LA-611	Polymers Complex	October 27, 1997
PSD-LA-647(M2)	Olefin Units	February 26, 2002
2800-V0	Storage Tank	April 17, 2002
2669-V1	Olefin Units	June 26, 2001
2151-V2	Alcohol and OFP Units	March 21, 2003
2729-V1	Cogeneration Unit	May 16, 2007
2727-V2	Logistics	May 24, 2007
3030-V0	EOEG-1 Unit	May 21, 2006
2057-V4	EOEG-2 Unit	March 21, 2007

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Permit Number	Units or Sources	Date Issued
2185-V2	EOEG-3 Unit	June 28, 2006
3001-V1	M Unit	May 2, 2006
2136-V2	Utilities	June 30, 2002
PSD-LA-611(M1)	Polymers Complex (PDO-1 Unit)	Application Pending
PSD-LA-647(M3)	Olefin Units	Application Pending
2489-V1	PDO-1 Unit	Application Pending
2669-V2	Olefin Units	Application Pending
2136-V3	Utilities	Application Pending
3001-V3	M Unit	Application Pending
2151-V3	Alcohol and OFP Units	Application Pending

III. PROPOSED PERMIT / PROJECT INFORMATION

Proposed Permit

A permit application and Emission Inventory Questionnaire dated May 2, 2002 as well as additional information dated April 27 and June 5, 2007, were submitted requesting a Part 70 operating permit renewal.

A notice requesting public comment on the permit was published in *The Advocate*, Baton Rouge, and in the local newspaper. A copy of the public notice was mailed to concerned citizens listed in the Office of Environmental Services Public Notice Mailing List. The application and proposed permit were submitted to the Ascension Parish Library. The proposed permit was submitted to US EPA Region 6. All comments will be considered prior to the final permit decision.

Project description

Shell Chemical LP requested a Part 70 operating permit renewal to include the PDO-1 Unit and part of the Common Facilities Unit (COMFAC). The PTT Unit which has never been constructed and the PTK Unit which was shutdown in 2000 were removed from the permit. Emissions from the facility were recalculated based on updated emissions factors and actual operating conditions of the unit.

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Permitted Air Emissions (tons/year)

Pollutant	Before	After	Change
PM_{10}	12.75	14.22	+ 1.47
SO_2	1.12	0.95	- 0.17
NO_X	94.42	19.66	- 74.76
CO	134.30	89.90	- 44.40
VOC	103.96	42.78	- 61.18
Toxic Air Pollutants (TAP)			
1,3-Butadiene	-	0.03	+ 0.03
Acetaldehyde	-	2.62	+ 2.62
Acrolein	4.36	1.39	- 2.97
Benzene	-	0.03	+ 0.03
Ethylene glycol	-	0.08	+ 0.08
Ethylene oxide	0.68	1.25	+ 0.57
Formaldehyde	-	0.03	+ 0.03
n-Hexane	-	0.05	+ 0.05
Methanol	29.92	0.26	- 29.66
Methyl ethyl ketone	-	0.04	+ 0.04
Methyl tert-butyl ether	18.19	15.23	- 2.96
Naphthalene	-	0.07	+ 0.07
n-Butanol	-	0.01	+ 0.01
PAH	-	0.02	+ 0.02
Propionaldehyde	-	2.33	+ 2.33
Sulfuric acid	-	0.01	+ 0.01
Toluene	-	8.40	+ 8.40
Xylenes	-	0.04	+ 0.04
Total TAPs	53.15	31.89	- 21.26

Prevention of Significant Deterioration (PSD) Applicability

NO_X and CO emissions from four emission points increased more than the limits of Permit PSD-LA-611. The emission increases will be less than the PSD significance levels for NO_X and CO. PSD review is not required. However, emission limits of Permit PSD-LA-611 were revised to accommodate these emission increases.

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Maximum Achievable Control Technology (MACT) requirements

Complying with 40 CFR 63 Subpart G or Subpart FFFF was determined as MACT for toxic air pollutants (TAPs) emissions from several tanks and the sump. MACT for the flare system is complying with 40 CFR 60.18 while MACT for fugitive emissions are complying with 40 CFR 63 Subpart H. The catalyst system vent complies with LAC 33:III.2115 as MACT.

Air Modeling Analysis

Emissions from the unit are not expected to cause or to contribute to any National Ambient Air Quality Standards (NAAQS) or Ambient Air Standards (AAS) exceedances.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the proposed Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the proposed Part 70 permit.

Applicable Requirements

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

IV. PERMIT SHIELDS

The Permit does not include any Permit Shields

V. PERIODIC MONITORING

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

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VI. APLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS

ID No:	Requirement	Status	Citation	Explanation
EQT610, EQT611 EQT612, EQT614	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
EQT613, EQT623 EQT624	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
	LAC 33:III.2153 – Industrial Wastewater	Does not apply	LAC 33:III.2153	Does not receive wastewater stream with VOC =>1000 ppmw
EQT615, EQT636 EQT637	LAC 33:III.2153 – Industrial Wastewater	Does not apply	LAC 33:III.2153	Does not receive wastewater stream with VOC =>1000 ppmw
EQT616, EQT620 EQT621, EQT625	LAC 33:III.1503. *Standards for SO_2*	Exempt	LAC 33:III.1503.C	SO_2 emissions < 250 tons/year
	LAC 33:III.1511 CEM for SO_2	Exempt	LAC 33:III.1511.A	SO_2 emissions < 100 tons/year
EQT618, EQT626	LAC 33:III.2107 – VOC Loading	Does not apply	LAC 33:III.2107.A.1	Vapor Pressure < 1.5 psia
EQT619	LAC 33:III.2115 – Waste Gas	Exempt	LAC 33:III.2115.H.1.c	VOC emissions < 100 lbs/24 hours
EQT622	LAC 33:III.2153 – Industrial Wastewater	Does not apply	LAC 33:III.2153	Does not receive wastewater stream with VOC =>1000 ppmw
	LAC 33:III.5109 MACT Requirements	Does not apply	LAC 33:III.5109.A	MACT is not required for Class III TAPs
EQT627, EQT630	LAC 33:III.5109 MACT Requirements	Does not apply	LAC 33:III.5109.A	MACT is not required for Class III TAPs
EQT628	40 CFR 63 Subpart Q	Does not apply	40 CFR 63.400	No chromium based water treatment chemicals are used
EQT641	40 CFR 63 Subpart FFFF - MON	Does not apply		The lab is not a part of a MCPU
EQT659	40 CFR 63 Subpart FFFF - MON	Does not apply		Maintenance wastewater
FUG017	LAC 33:III.2121 LAC 33:III.2122 NSPS Subpart VV	Does not apply	LAC 33:III.2121 LAC 33:III.2122 *40 CFR 60.480*	The unit is not list as an affected facility

The above table provides explanation for both the exemption status or non-applicability of a source cited by 2 or 3 in the matrix presented in Section X of the permit

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VII. STREAMLINED REQUIREMENTS

The Permit does not include any streamlined requirements.

VIII. GLOSSARY

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

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Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H_2S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

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NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.